

Making EU Climate Policy Fit for Climate Neutrality

Conceptual hallmarks of transformative climate policy and the role of innovation, infrastructure, investment and integration across sectors to inform an effective EU climate strategy

Main Messages

- 1.** The 2020s are the pivotal decade to get on the path to climate neutrality by 2050. EU climate policy needs to rise to this challenge. The EU's overall ambition has increased, and its governance mechanisms are being improved but most instruments and the overall policy mix remain designed for incremental change.
- 2.** Beyond tinkering: EU climate policy as a whole must become "mission oriented" towards climate neutrality. Thinking back from the end, policy should be informed by and measured against what is needed to achieve the necessary change.
- 3.** Beyond carbon pricing: The EU has proven the usefulness of carbon pricing as a policy tool and is rightly seeking to extend its use. However, infrastructure and innovation require dedicated support. Technology shifts need both push and pull instruments – which cannot be technologically neutral.
- 4.** Beyond sectoral policies: Parallel and interdependent change needs to take place in all sectors. EU policy needs to be equipped to coordinate these change processes, keep them aligned and foster integration across sectors. This includes being experimental where possible, and stringent where necessary.
- 5.** Beyond the Berlaymont: The transformation will only succeed if it is built on broad societal support. European climate policies must therefore become more inclusive, participatory, and deliberative – seeking not only passive acceptance, but the active support and engagement of Europe's citizens.

The 2020s are the pivotal decade for the transformation to a climate-neutral EU

Stopping the climate crisis requires a rapid reduction of emissions globally and in the EU. To do so, many portions of the EU economy need to be transformed – not only its energy systems, but also mobility, heating, food, and industry. Each of these decarbonisation challenges should be addressed with the simultaneous goal of creating a more resilient, resource-efficient, and sustainable EU.

The EU economy and its infrastructure were built for a fossil-based economy. Overcoming the path-dependency and lock-in does not happen overnight: Given the long lead times involved in the planning, decision-making and implementation of policies, the 2020s are pivotal to induce the necessary change before the window of opportunity for transformative action closes.

EU climate policy has transformative ambition...

The EU and its Member States have expressed a transformative ambition in adopting the objective to make Europe the first carbon-neutral continent by mid-century (European Commission, 2019). The EU's ambition is also enshrined in its Climate Law, and it has

simultaneously decided to raise its target for 2030 to -55% against 1990 levels. This represents a step change from the previous goal of -20% by 2020 – and is more in line with a path towards climate neutrality. With the European Green Deal and the Fit for 55 Package, the EU has started to reform its governance mechanisms as well.

... but most policies are still geared at incremental change.

Yet the current instrumentation of EU climate policy does not match the ambition of the EU's climate targets. EU climate policy is still predominantly focused on delivering incremental improvements along existing technological trajectories through sector-specific interventions, such as efficiency standards and labels for vehicles or appliances. There is much less in the way of overarching policies and the different elements of European climate and energy policy are not well integrated. If adopted, the fit-for-55 package can represent a step toward greater ambition and coherence – yet the next challenge will be to make EU climate policy fit for net zero.

Between incremental and transformative: EU climate policy at 'Fit for 55'

As of 2021, the climate targets, policies, and governance mechanisms of the EU are currently in-between incremental improvements and transformative changes. With the Climate Law, the EU has set itself a new legally binding long-term goal of climate neutrality by 2050. The EU also significantly raised its ambition for 2030: by then, emissions should be 55% below 1990 levels.

Achieving these goals requires deep, broad, and fast changes across the economy – which implies transformative policies.

The 'Fit for 55' legislative package is meant to deliver the instruments for reaching these targets (European Commission, 2021). The package has transformative potential in some respects – but falls short in others.

For the energy sector, the combination of increased energy efficiency and renewables targets charts the way to a decarbonised energy supply. For industry, the expanded innovation fund and envisaged instruments such as Carbon Contracts for Difference have the potential to drive deep emission reductions. For both sectors, the transformation is flanked by proposed reforms of the EU Emissions Trading System, especially a much steeper reduction of the available emission allowances. While more action is needed in several regards, especially in terms of infrastructure and investment (e.g., battery storage, power grids, regulation and infrastructure for green hydrogen), the mix of instruments has the potential to drive transformative change.

In other areas, it is less clear how the package could initiate the needed transformative change, e.g., in transport. While the tightened emission performance standards for vehicles along with the proposed ETS for heating and transport may support a shift to electric vehicles, it falls short of a clear phase-out for combustion engines, nor does it support a broader transformation of mobility away from road and air transport towards bus and rail, shipping, cycling and walking.

To become transformative, climate policies need to go beyond “policy as usual”

To raise to the challenge of climate neutrality, EU climate policy must evolve from incremental to transformative and address the following aspects.

Beyond Tinkering

Backcasting from the goal of EU climate neutrality by 2050, the current incremental approach will not be sufficient to deliver the needed transformation. Climate policies must be measured by the extent to which they are aligned with these future goals.

To shift from incremental to transformative, EU climate policies need to match the increased ambition of the climate goals in three dimensions: the depth of change, its breadth and its speed (Fazey et al., 2018):

- **Depth:** Climate neutrality entails a fundamental transformation in each sector, reconfiguring value chains and business models. The transformation is not merely a technological one, but also economic, political, and social. Such change will be felt in the lives of many – as citizens, neighbours, employees, or shareholders.

- **Breadth:** These parallel and interdependent transformations need to be coordinated across sectors, and across the different phases of the process.
- **Speed:** All of this needs to happen at a much quicker pace – the 2020s is the decisive decade to remove existing obstacles and drive the necessary changes.

To move to a pathway that is commensurate with climate neutrality in 2050, Europe needs to overcome the existing socio-economic, technological and political path dependencies that lock in the fossil development model – and instead create self-reinforcing mechanisms to perpetuate positive change towards climate neutrality (Seto et al., 2016). Change processes in different sectors can enhance each other – expanding renewable electricity, for instance, allows direct electrification in transport, heating or industry, and hydrogen-based alternatives where direct electrification is not possible.

Beyond carbon pricing

Carbon pricing is a very effective tool to accelerate the switch between existing technologies and to coordinate mitigation efforts across sectors. For this reason, the carbon price should continue to play a central role in EU climate policy.

Yet for several reasons, the carbon price is no silver bullet and needs to be accompanied by other instruments:

- To become commercially viable, low-carbon technologies need infrastructure, funding and an enabling regulatory environment. This means dedicated **innovation** policies to help develop and deploy solutions, but

also **exnovation** policies to manage the phase-out of fossil incumbent technologies.

- To contain distributional effects, households need available alternatives that allow them to respond to the carbon price – from home insulation to public transport. Social flanking of the carbon price also includes targeted support for those in need of assistance, especially poorer households, but also particularly vulnerable groups.

Beyond technological neutrality

Technological neutrality is seen as a hallmark of efficient climate policies. Yet it only works in instances where there is an open search process, in which different solutions can compete on a level playing field. But in the transformation to climate neutrality, there are many instances where such an open-ended search process is not possible because of technological and socio-economic path dependencies involved, the short timeframe for the transformation and the long lead times for changes in technological regimes. In such instances, the challenge is rather to identify the most promising option and to scale it up fast enough (Agora Verkehrswende, 2020).

In this context, efficiency remains relevant but takes on a different meaning: where technological solutions have been identified and where the regulatory environment and infrastructure are in place, competitive markets are an excellent tool to scale up solutions quickly while keeping costs low.

Also, when designing and evaluating climate policies for the long run, their dynamic efficiency (bringing down costs over time)

becomes more relevant than their static efficiency (choosing the least-cost solution at any given point in time).

Beyond sectoral policies

One hallmark of the transformation are interdependent change processes that occur in parallel – across economic sectors and across political departments. Transformative climate policy therefore needs to develop an “all-of-government” approach, making sure not only that each sector rises to the challenge of transforming to climate neutrality, but also that sectoral efforts remain aligned. This underlines the need for integration and coordination – and also involves managing frictions and conflicts between sectoral strategies where they occur.

Beyond the Berlaymont

The transformation will only succeed if it is built on broad societal support – paying particular attention to the social effects of the transformation. European climate policies must evolve to become more inclusive, participatory and deliberative. Transformation is also a social project – and as such requires not only passive acceptance, but the active support and engagement of Europe’s citizens.

This also includes rethinking and rebalancing the role of the state, businesses and society, including how the costs and benefits are shared between public and private players. Transformation requires an active state that takes risks and drives change – but it equally relies on engaged citizenry and a supportive private sector.

Beyond Optimality

The transformation to climate neutrality is not a process that can be meticulously planned and analysed ex-ante. Nor can it be left to the market to find and implement the optimal outcome. Some degree of technological specificity cannot be avoided in this process, at the same time the technological, socio-economic and political uncertainties loom large.

Some approaches can help to navigate these challenges:

- Long-term strategies to provide orientation: sectoral as well as integrated, cross-sectoral roadmaps and scenarios that map possible technological pathways, highlight choices to be taken, and present interdependencies across sectors.
- Ongoing progress monitoring to assess how policies are performing, net zero indicators to measure whether underlying structural trends (e.g., infrastructure, innovation, investment) are aligned with targets.
- Institutional arrangements to identify the adjustment needs of policies at regular intervals and keep them on track towards the long-term goal.
- Sound principles and a consistent regulatory philosophy as a basis for the policy mix: for instance, seeking agreement on the broad lines of techno-economic development in a deliberative political process – while also organising delivery and implementation as a market-based process, allowing for competition and cost minimisation, and leaving the necessary space for experimentation.

The 4i challenges: Four benchmarks for transformative climate policies

Transformative climate policy is not only about reducing emissions but about initiating and driving forward the systemic changes that are needed to take the economy to climate neutrality. One particular challenge is that the necessary change processes are no longer confined to individual sectors such as transport or housing but are crosscutting in nature. Sectoral approaches – predominantly the domain of traditional climate policy – are no longer sufficient. Change needs to happen in all sectors at once and since many of the required solutions extend across sectors, policy will create interdependencies and bottlenecks.

The 4i-TRACTION project has identified four key challenges that can, if tackled, become key drivers for the transformation to climate neutrality: stimulating **innovation** to transform the material base of our economy, shifting **investment** & finance, rolling out the **infrastructure** for a resilient, climate-neutral economy, and achieving **integration** of sectoral systems.

Innovation

Transforming to climate neutrality requires technological, business model, and policy/governance innovations.

An important element of the transformative innovation challenge is the limited time in which it needs to deliver, given that the transformation needs to be completed by 2050. This warrants focusing technological innovation policies on the following areas:

- demonstrating and deploying technologies for which there is high confidence that they will reach maturity,
- creating markets for innovative technologies, systems, and products,
- accelerating learning curves of technologies to depress their costs and help their widespread diffusion,
- kickstart targeted innovation processes in areas that still lack low-carbon solutions with high confidence for market maturity.

Business model innovation is closely connected to technological innovation and refers to the way businesses reorganise themselves to create and deliver value in the low-carbon economy.

Policy/governance innovation is the process of modifying existing – or developing new – policies or governance mechanisms. This includes new policy instruments and institutions.

Infrastructure

The infrastructure challenge is fundamental to achieving climate neutrality, as well as other key EU objectives such as ensuring security of energy supply.

Rolling out climate-neutral infrastructure requires thinking back from the end: for instance, a climate-neutral economy will rely largely on renewables and the widespread electrification of end-uses, as well as

reconfiguring value chains towards a circular, low-carbon industry. Infrastructure must therefore accommodate larger volumes of electricity, which will be generated in a more intermittent and decentralised way.

Infrastructure is not technology neutral. It therefore plays a key role in overcoming carbon lock-in. Infrastructure is long-lived – and infrastructure choices strongly influence which technologies become economically viable. All new infrastructure developments must therefore be aligned with climate neutrality.

Ensuring that the right infrastructure is in place at the right time requires strategic long-term planning and effective governance. These need to take into account cost-effectiveness but also interdependency with other developments, the uncertainties in future demand and supply of energy as well as the long lead times of infrastructure planning and deployment.

Finally, infrastructure is expensive, and once it is built, often constitutes a natural monopoly. Therefore, the sharing of risks and benefits between public and private actors is particularly relevant for infrastructure investments.

Investment & Finance

The prevailing approach to facilitating investment and finance for climate neutrality has not led to transformative outcomes – neither within the finance sector itself, nor in the real economy. First, because this approach confined itself to the niche of green finance, and second, because financial regulation was mainly limited to increasing transparency.

To change this, climate finance policies must broaden their focus from the niche of green finance to overall finance and investment flows

and tackle internal governance issues. This implies inter alia the following:

- Apply a more granular perspective beyond the predominant identification of green activities, that also assesses the transition and adaptation plans for each company.
- Leverage financial regulation to make climate issues mainstream. Internal procedures, incentives and governance structures of financial institutions are crucial for integrating climate issues into the operations of financial institutions. So far, these are shaped by conventional financial sector regulation. If left unchanged, they may perpetuate existing path dependencies rather than driving change.
- Review mandates of financial regulators. To some extent, financial regulators and supervisors in Europe have begun to incorporate climate issues under their existing mandates, in other cases, mandates need to be clarified or extended.
- Contribute to the phase-out of incumbent fossil technologies, while managing the effects that exnovation and the stranding of assets may have on the financial sector and the economy as a whole.

An underlying question concerns the efficient blend between public and private funding for technology development and infrastructure investments, as well as the sharing of risks and benefits of transformative investments between public and private actors.

Integration

Integration refers both to sector integration – the linking of different sectors through

technological solutions – and to climate policy integration – the systematic integration of climate policy objectives across different sectors. Integration in both senses is crucial for the transformation to climate neutrality.

The linking of technological developments in different sectors creates a range of technological, governance, regulatory, and market challenges. Energy system integration, for instance, implies the integration of the energy consuming sectors (buildings, industry, transport) with the power producing sectors. Coordinated planning is needed to integrate the technological developments, infrastructural needs, and specificities across sectors.

Integration in the sense of mainstreaming climate policy objectives relates to the need to systematically integrate climate considerations into different policies across various sectors and at multiple levels of governance. Integration of different policies towards a holistic vision is one of the rationales of the European Green Deal.

Climate policy integration can be advanced through different means. At the procedural level, it is important that climate policy considerations be taken up during the policymaking process, for example through climate impact assessments. Climate policy integration also requires that policymakers balance climate and other sectoral policy objectives (Dupont, 2016).

Overlap and interrelation of the 4i's

The 4i's are distinct challenges in the transformation to climate neutrality, which all require a distinct policy response. Yet they are also interrelated in many ways. For instance, innovations will only scale up if investments are directed at unleashing them. And without the right infrastructure in place, these innovations will find a hard time competing with incumbent technologies. Therefore, integration is crucial for effectively reaching climate neutrality.

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